

# Collembola from the Three Kings Islands with a Description of *Proisotomina*, New Genus

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The species recorded in this paper were all obtained, using my portable extraction apparatus, from leaf-mould collected under large-leaved trees and ngaio trees on Great King Island of the Three Kings Group in May, 1946, by Mr. E. G. Turbott.

Six new species are described and new records, with brief descriptions, are given for three species previously unknown from the New Zealand region. Other known New Zealand species also recorded from the Three Kings Islands are:—

*Triacanthella rubra* Salmon.

*Podurhippus armatus* (Nicolet).

*Brachystomella terrafolia* Salmon.

*Clavontella caerulumbrosa* Salmon.

*Mesaphorura minutissima* Salmon.

*Gnathalonche angularis* (Salmon).

*Megalothorax novae-zealandiae* Salmon.

## Genus *GNATHALONCHE* Börner, 1906.

With the addition of the following new species there now will be two species belonging to this genus known from New Zealand.

*Gnathalonche sensilla* n. sp. Figs. 1-2.

*Colour:* White.

*Clothing:* Of moderately long, simple setae interspersed with equal length bristle-like setae which are very faintly serrated: on the dorsal surface are numerous short curved simple setae: the bristle-like setae are of almost equal width from base to tip, and some are arranged in rows, one transverse row of 4-5 bristles to each segment: sometimes the apex is slightly dilated.

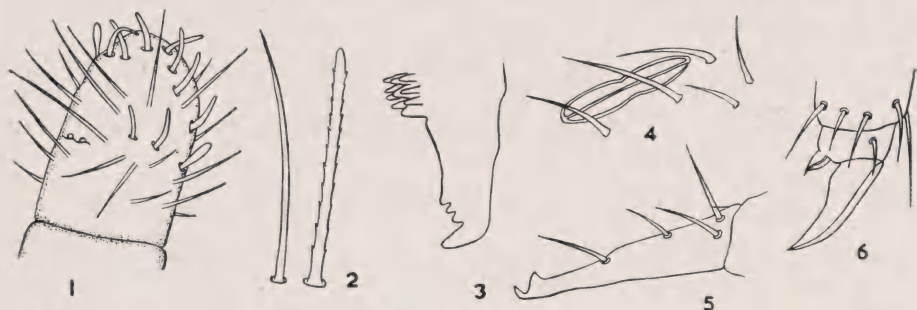
*Body:* Length, up to 1.1 mm. There is a boss to each side of the head, with an irregular boss-like mass between them, ocelli two to each side, unpigmented, one on the posterior lateral face of each side boss

and one on the head forward of the boss. Ants. III and IV fused. Ant. I of one antenna with a large sensory papilla, Ant. II of the other antenna with a similar sensory papilla. Ant. IV of both antennae with two similar large sub-apical sensory papillae, 8-9 apical and sub-apical long, bent, sense rods and numerous short and very long setae. The large sensory papillae of Ants. I, II, and IV are not always present and may denote a sexual character. About the centre of the fused segments III and IV are two small sensory papillae in a deep groove.

*Legs:* Claw granulate without any teeth, unguiculus absent.

*Type:* Microscope slide 4/1, Auckland Museum Collection.

*Co-type:* Slide 3/2190, Dominion Museum Collection.



Figs. 1-2. *Gnathalonche sensilla* n. sp. 1, Ant. IV, showing sense organs; 2, setae from body.

Figs. 3-6 *Folsomides neozealandia* n. sp. 3, apex of mandible; 4, postantennal organ; 5, mucro-dens; 6, foot.

### Genus **FOLSOMIDES** Stach, 1922.

The species described below is the first occurrence in New Zealand of this somewhat rare and interesting genus.

#### **Folsomides neozealandia** n. sp. Figs. 3-6.

*Colour:* White, with two black ocellar spots.

*Clothing:* Of moderately long, simple setae.

*Body:* Length, up to 0.75 mm. Antennae three-quarters length of head, the four segments related as 6:8:10:15; Ant. IV without apical organ but with 7-8 long, curved sense rods among numerous curved setae of equal length; sense organ of Ant. III sub-apical and consisting of a pair of stout papillae arising from individual pockets. Postantennal organ long and narrow, six times as long as broad, double outlined with central longitudinal band and a constriction across the middle of the long axis; the whole organ may be a little less or a little longer than the width of Ant. I and is supplied with three guard setae. Segments of the body related as 7:6:5:5:5:7:4:3. Ocelli two to each side on black granular pigment spots, the anterior ocellus much larger than the posterior one. Rami of tenaculum each with three teeth. Mandible with large apical tooth and three smaller sub-apical teeth.

*Legs:* Claw without teeth but with a basal bulge on inner edge. Unguiculus present on hind feet but reduced, rudimentary, on fore and middle feet, a basal seta to each side of claw and a delicate non-clavate tenent hair, a little shorter than claw, to each foot.

*Furcula:* Mucrodens two-thirds length of manubrium; dens and mucro fused, bearing three ventral setae, the mucro with a sharp apical tooth and a longer sharp pre-apical tooth. Manubrium with four pairs of ventral setae and a lateral seta to each side.

*Type:* Microscope Slide 4/2, Auckland Museum Collection.

*Co-type:* Slide 3/2181, Dominion Museum Collection.

*Remarks:* This species is very closely allied to *F. exiguus* Folsom from Hawaii which it resembles in the structure of the feet and mucrodens; it differs quite distinctly, however, in the form of the postantennal organ and the apical dentition of the mandibles.

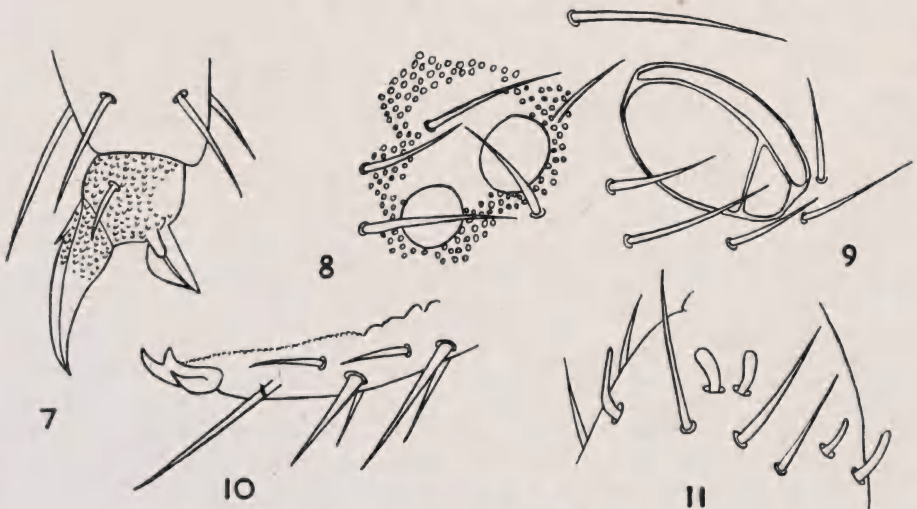
### Genus SORENSIA Salmon, 1948.

The occurrence of a species of this sub-antarctic genus on the Three Kings Islands is indeed interesting. *Sorensia* is described as a new genus in my recent paper on the Subantarctic Collembola, the type locality being Campbell Island. I have not yet located it on the mainland of New Zealand. With the inclusion of the Three Kings material the genus now contains three species.

#### *Sorensia anomala* n. sp. Figs. 7-11.

*Colour:* White, with black granular ocellar field.

*Clothing:* Short to moderate simple setae interspersed more particularly around posterior, with strongly serrated setae.



Figs. 7-11. *Sorensia anomala* n. sp. 7, foot; 8, ocelli; 9, postantennal organ; 10, mucro and apex of dens; 11, sense organs on Ant. III.

*Body*: Length, up to 1 mm. Antennae from one-third to a half as long again as head, the four segments related as 14:18:22:37. Ant. IV without apical sense organ but having many short, delicate setae interspersed with slender sense rods. Subapical sense organ of Ant. III consisting of a pair of stout straight sense rods, fully exposed, and, to one side, a slender rod somewhat removed, together with a fourth smaller rod close by between it and the pair, while somewhat removed on the other side is a single large curved sense rod. Ocellar pigment spot irregular with two ocellar spots and several guard setae. Postantennal organ elliptical, twice as long as wide, with central raised longitudinal brace and sometimes a side brace, the whole protected by four guard setae. Abd. III a little longer than IV. Rami of tenaculum each with four barbs; the corpus with two long, curved setae.

*Legs*: Claw granulate basally, without inner teeth but with a pair of very small outer teeth, one to each side, about one-third down. Unguiculus short, curved, with very broad inner and outer lamellae, of which the inner is curved, and with a prominent basal fingerlike process on inner surface. A fairly long basal seta to each side of claw. Sometimes on each hind foot a very slender usually faintly clavate tenent hair shorter than the claw.

*Furcula*: Reaching to posterior border of Abd. I. Dens two-and-a-quarter times as long as manubrium, annulated and corrugated along central section, the apical uncorrugated portion two to two-and-a-half times, the basal portion 12-14 times, length of mucro. Dens with several long simple apical setae; mucrodens joint indistinct; manubrium dorsally bearing numerous long spine-like setae; dens with 2-3 rows of short spine-like setae. Mucro with equal strong apical and sub-apical teeth and a large lateral basal tooth on inner edge.

*Type*: Microscope Slide 4/3, Auckland Museum Collection.

*Co-type*: Slide 3/2168, Dominion Museum Collection.

### Genus **FOLSOMINA** Denis, 1931.

#### **Folsomina onychiurina** Denis, 1931. Figs. 12-13.

This is the first record in New Zealand of a genus and species which previously has been recorded only from Florida and Western Australia.

It is a small, white species of *Folsomina* facies up 0.7 mm. in length. Abd. IV-VI fused. Ocelli and postantennal organ absent. Antennae about half as long again as head. Ant. IV with two large sub-apical sensory papillae, close together, and four bent sense rods as well as a clothing of simple setae; Ant. III with two sub-apical short exposed sensory papillae each arising from its own pocket. Rami of tenaculum each with four teeth; corpus with two long, curved setae.

*Clothing*: Of simple setae longer posteriorly.

*Legs*: Claw without any teeth, unguiculus lanceolate, about one-third to a-half as long as claw. Tenent hairs absent. A long basal seta to each side of claw.

*Furcula*: Short. Dens two-and-a-half times longer than mucro, irregularly annulated and corrugated; mucro falciform.

### Genus **ISOTOMINA** Börner, 1906.

#### Genus **PROISOTOMINA** nov.

With the separation of *Isotomina* from *Proisotoma* on the fusion or not of Abds. V and VI, together with the separation of *Parisotoma* and *Isotomiella* from *Isotoma* by Bagnall on the basis of the number of ocelli, some difficulty occurs in correctly placing *Isotomina subalpina* Salm. and *Parisotoma linnaniemia* (Wom.), both of which have the ocelli reduced, and the fifth and sixth abdominal segments fused. I have decided, therefore, to erect a new genus *Proisotomina* for their reception and to redefine the genus *Isotomina* Börner as having *Abds. V and VI fused with eight ocelli to each side*, and the genus *Parisotoma* Bagnall as having *Abds. V and VI not fused with the ocelli reduced to six or less on each side*.

The genus *Proisotomina* nov. may then be defined thus:—

Abds. V and VI fused; ocelli six or less to each side; postantennal organ present. Ant. IV with apical sensory organ; Ant. III with sensory organ; clavate tenent hairs present or absent; furcula present but sometimes reaching only to Abd. II.

Genotype: *Proisotomina (Isotomina) subalpina* (Salmon, 1944).



Figs. 12-13. *Folsomina onychiurina* Denis. 12, apex of Ant. IV; 13, mucro and apex of dens.

Figs. 14-15. *Isotoma raffi* Womersley. 14, seta from posterior of body; 15, ocelli and postantennal organ.

Fig. 16. *Isotomina thermophila* Axelson. Mucro.

### Genus **ISOTOMINA** Börner, 1906.

One cosmopolitan species belonging to this genus occurs on the Three Kings Islands.

#### ***Isotomina thermophila*** Axelson. Fig. 16.

*Colour*: Light greyish blue, paler ventrally and on the appendages; ocellar fields darker blue.

*Clothing*: Of short, simple setae with a few longer ones posteriorly.

*Body*: Length, up to 0.8 mm. Antennae only slightly longer than head, the four segments related as 8:13:14:25. Ant. IV without apical sense organ but with numerous long, curved, tapering sense rods set amongst slender, straight setae. Sub-apical sense organ of Ant. III consisting of a pair of fully exposed straight or curved sense rods, each arising from its own pit. Ocelli eight to each side, sub-equal, with the anterior two, if any, the larger. Postantennal organ oval, twice as long as diameter of adjacent ocellus and two-and-a-half times as long as broad. Abd. IV a little longer than Abd. III. Rami of tenaculum each with four barbs.

*Legs*: Claw finely granulate, without any teeth or tenent hair, but with a long basal seta to each side. Unguiculus finely granulate about half as long as claw with outer edge straight and inner curved.

*Furcula*: Reaching to posterior border of Abd. II. Manubrium: dens: mucro as 20:23:5. Manubrium with a long, plain dorsal seta overhanging joint with dens and several ventral and lateral setae; dens with a few crude corrugations at middle, two rows of short dorsal setae, and 2-3 ventral setae. Mucro broad at base with small apical tooth and very large pre-apical tooth.

*Remarks*: This species is readily separated from the two species of *Isotomina* occurring on the mainland by the relatively short, fat mucro, which is unlike the usual tapering form of mucro found in this genus.

### Genus **ISOTOMA** Bourlet, 1839.

#### **Isotoma raffi** Womersley, 1934. Figs. 14, 15.

Several specimens of this Australian species were amongst the Three Kings material and they constitute the first record of the species in New Zealand.

It is a greyish-white coloured insect with two small dark-pigmented ocellar patches on each side. Clothing of simple setae with longer, very strongly serrated setae posteriorly. Ocelli two to each side on separate pigment patches, the anterior ocellus much the larger; postantennal organ oval with longitudinal band or arch, twice as long as broad and two to three times longer than the anterior ocellus which it almost touches; rami of tenaculum each with four teeth.

*Legs*: Claw without teeth but with a long basal seta to each side; unguiculus about half as long as claw with broad inner and outer lamellae.

*Furcula*: Mucrodens about two-and-a-half times as long as manubrium, the mucro with equal apical and subapical teeth and a long lateral tooth in outer edge.

Genus **PSEUDOSINELLA** Schaeffer, 1897.

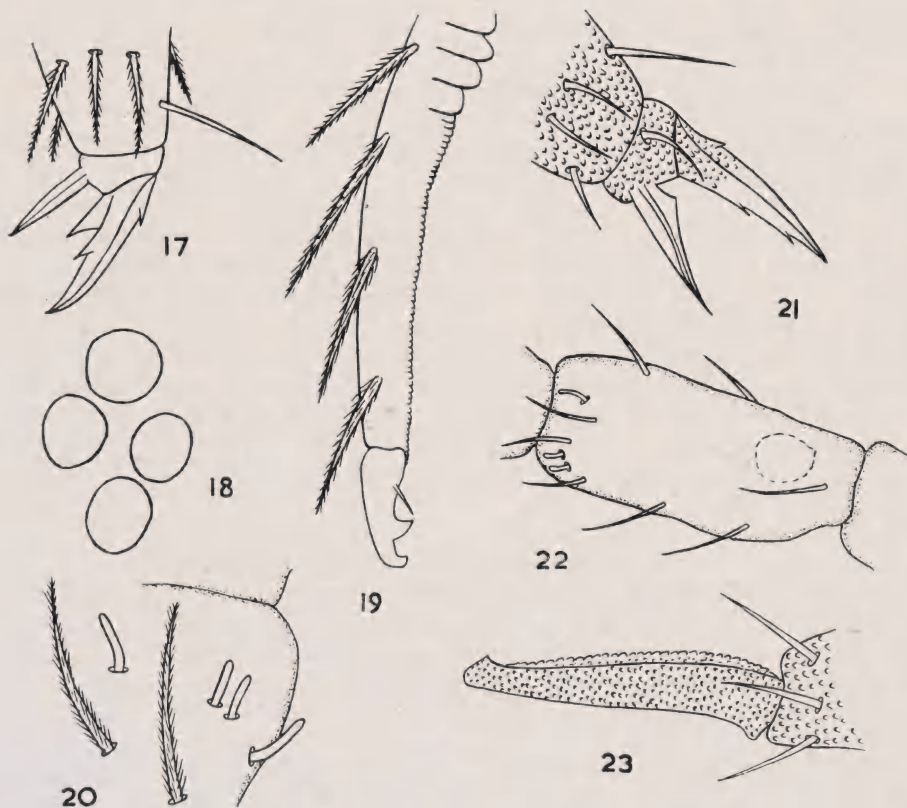
With the addition of a new species from the Three Kings there are now six species known in the New Zealand region.

**Pseudosinella dispadentata** n. sp. Figs. 17-20.

*Colour*: White, the ocellar fields deep blue, Ant. IV with a bluish tinge.

*Clothing*: Of short ciliated setae and hyaline scales.

*Body*: Length, up to 0.8 mm. Antennae only a little longer than the head, the four segments related as 10:18:16:32. Ant. IV somewhat dilated, clothed with numerous short, curved ciliated setae interspersed with shorter straight tapering sense rods. Sub-apical sense organ of Ant. III consisting of a pair of short, straight, exposed sense rods close together and a longer bent sense rod somewhat removed to each side. Ocelli four to each side, subequal; bothriotrichia present on Abd. IV, which is about three times longer than Abd. III.



Figs. 17-20. *Pseudosinella dispadentata* n. sp. 17, foot; 18, ocelli; 19, mucro and apex of dens; 20, sense organ at apex of Ant. III.

Figs. 21-23. *Metakatianna nigraoculata* n. sp. 21, foot; 22, Ant. III, showing sense organs; 23, mucro and apex of dens.

*Legs:* Claw with a pair of large outer teeth one to each side, at about one-third down, and two large inner wing-like teeth, one at centre, the other just before centre. Unguiculus lanceolate and reaching to level of second inner tooth; a slender non-clavate tenent hair about half as long as claw to each foot.

*Furcula:* Manubrium and dens subequal, dens annulated and corrugated, the apical uncorrugated portion three times as long as mucro. Mucro elongate with two unequal teeth and basal spine, the apical tooth being small and slightly recurved, the subapical much longer.

*Type:* Microscope Slide 4/4, Auckland Museum Collection.

*Co-type:* Slide 3/2171, Dominion Museum Collection.

### Genus **METAKATIANNA** Denis, 1933.

In 1944 I described a species of *Metakatianna* from D'Urville Island. I can now add a further species from the Three Kings, making two species of the genus known from New Zealand, neither of which is found on the mainland.

***Metakatianna nigraoculata* n. sp. Figs. 21-23.**

*Colour:* White, with deep-blue-black ocellar fields.

*Clothing:* Of normal simple setae, bothriotrichia of Abd. V extremely long, one to each side.

*Body:* Length, up to 0.3 mm. Antennae about half as long again as head, the four segments related as 6:10:12:30; Ant. IV faintly annulated, clothed with moderately long, simple curved setae and apically with 7-8 short, slightly bent sense rods; Ant. III with large sub-basal wart-like organ and apical sensory organ of two fully-exposed short straight sense rods arising close together, each from its own socket, and protected by two guard setae, and a third single similar sense rod, somewhat removed, with a single guard seta; ocelli eight to each side, the posterior and central ones very small, remainder large, equal; cuticle finely granulate.

*Legs:* Claw finely granulate basally with two small inner teeth, one near centre, the other at three-quarters down and two strong outer teeth, one to each side, at about one-third down. Unguiculus about half as long as claw with broad inner and outer lamellae, of which the inner has a strong angle near base; no tenent hairs, but a long, curved basal seta to each side of claw.

*Furcula:* Manubrium to dens to mucro as 8:20:8, dens with apical girdle of eight setae; mucro strongly granulate with slightly upturned apex, inner lamella very finely serrated; outer lamella plain.

*Type:* Microscope Slide 4/5, Auckland Museum Collection.

*Co-type:* Slide 3/2196, Dominion Museum Collection.



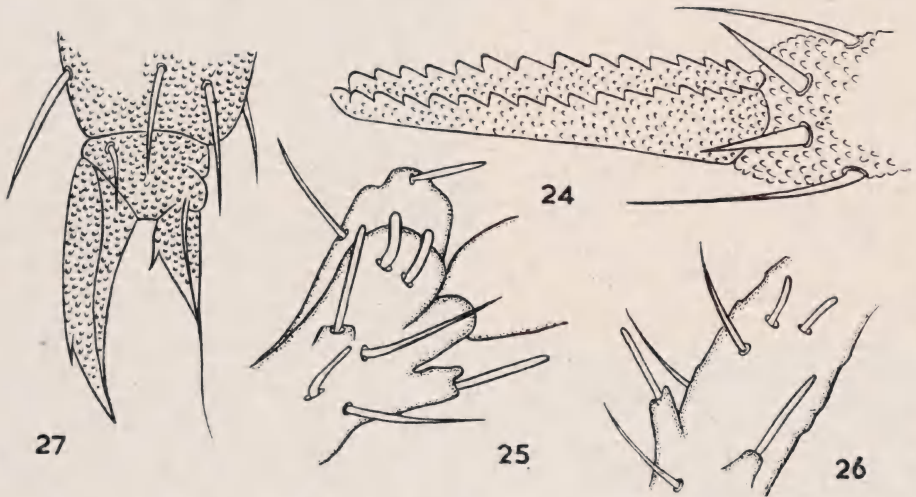
Genus **DICYRTOMINA** Börner, 1906.

With the inclusion of the following new species four species and one sub-species belonging to this genus are now known from New Zealand.

**Dicyrtomina turbotti** n. sp. Figs. 24-27.

*Colour*: Pale-yellow with purplish antennae, darkest towards tips; ocellar fields dark purple to black.

*Clothing*: Occasional simple setae with spines on top of head and around posterior of abdomen; dens with four pairs of ventral setae, numerous basal spine-like setae and an apical girdle of short, stout spines; legs sparsely clothed with short simple setae; four moderately long lasiotrichia to each side of abdomen, the upper bothriotrich on each side carries two lasiotrichia.



Figs. 24-27. *Dicyrtomina turbotti* n. sp. 24, micro and apex of dens; 25, sense organs at apex Ant. III; 26, sense organs at centre Ant. III; 27, foot.

*Body*: Length, up to 0.8 mm. Antennae one-third as long again as head, the four segments related as 35:100:145:62; segments II and III (particularly the latter) with swellings and protuberances and sparsely clothed with stout simple setae; Ant. II with either a single or a pair of short exposed sense rods at one-third from base, a larger central sense rod with, usually, a pair of shorter ones and either a single or a pair of moderately long, straight, sub-apical sense rods; Ant. III sub-apically with a pair of long, curved, exposed sense rods and having each protuberance bearing a small sense rod; Ant. IV clothed with

numerous long curved setae and supplied with a small apical finger and 9-10 short straight sense rods. Ocelli eight to each side, the central one very small.

*Legs:* Claw finely granulate without tunica and without inner tooth but with a pair of strong outer teeth at four-fifths down; unguiculus two-thirds to three-quarters as long as claw, with narrow outer lamella and broad angular inner lamella bearing a prominent spine at angle, the apical bristle filamentous on fore and middle feet much over-reaching tip of claw, short and bristle-like on hind feet but still over-reaching claw tip; a short basal seta to each side of claw.

*Furcula:* Manubrium: dens: mucro as 20:45:13: Mucro broadly spathulate, distinctly granulate and coarsely serrated along both edges and round apex.

*Type:* Microscope Slide 4/6, Auckland Museum Collection.

*Co-type:* Slide 3/2161, Dominion Museum Collection.